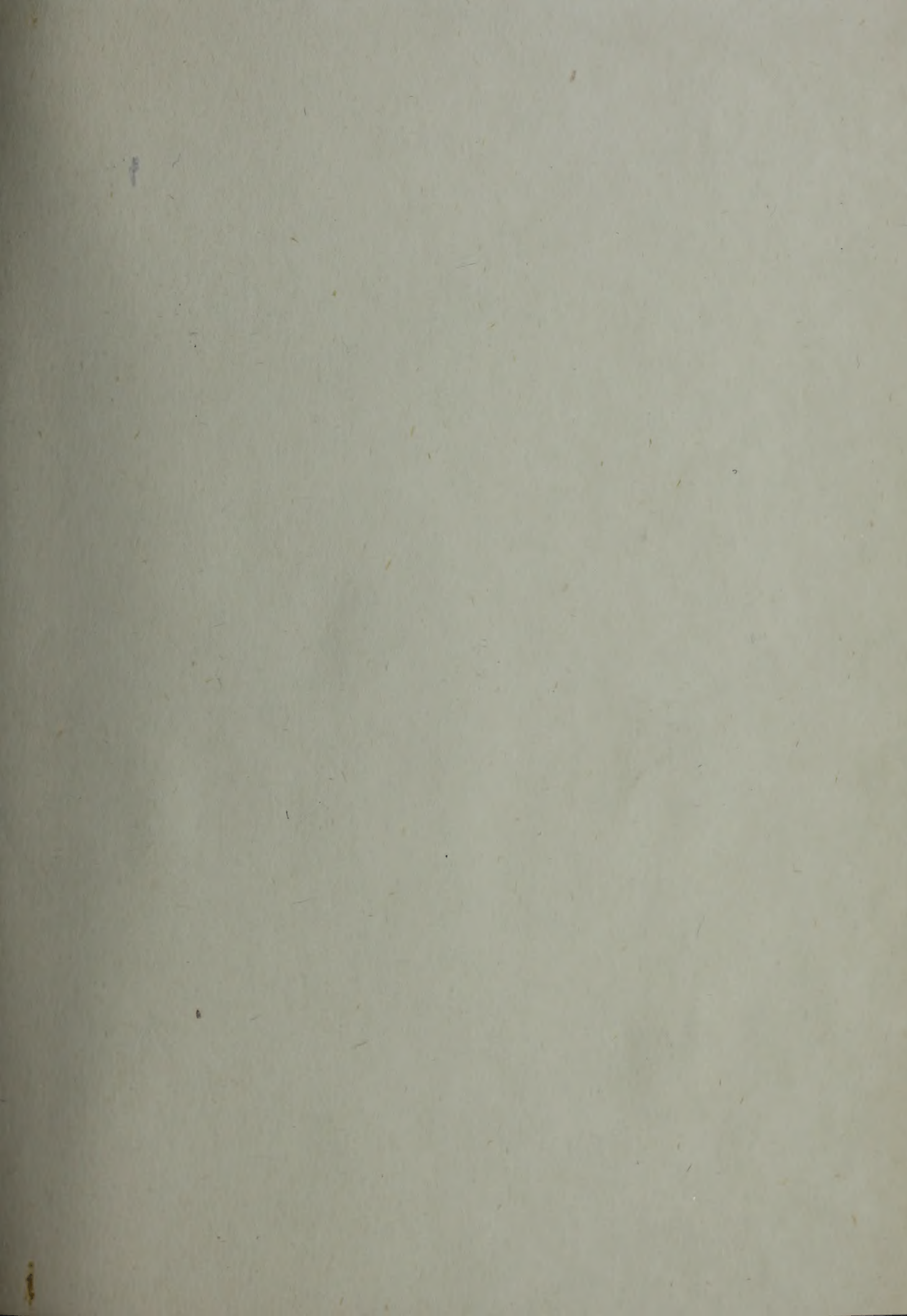


f
LP
F
5012
1909
S145

f
LP
F5012
1909
S145



3 9004 01511184 1



AMENDED PETITION

OF THE

ST. LAWRENCE POWER COMPANY,
LIMITED.

TO

His Excellency, The Governor-General
of Canada, in Council

FOR PERMISSION

To Erect the Structures Herein Described Near the
Town of Mille Roches, Ontario.

f

LPF5012
1909
5145

120 3481

INDEX

	Page
PRELIMINARY.....	1
MAP SHOWING GENERAL LOCATION OF PROPOSED WORKS.....	2
DAMS.....	3
CANADIAN POWER HOUSE.....	3
SOUTH SAULT POWER HOUSE AND LOCK.....	3
POWER HOUSE ON BARNHART ISLAND	3
CONTROLLING WORKS ...	3
STABILITY OF STRUCTURES.....	4
MISCELLANEOUS CONSTRUCTION	4
GOVERNMENT APPROVAL AND INSPECTION.....	4
FUTURE WATER LEVELS.....	4
CORNWALL CANAL CONDITIONS.....	4
CONDITIONS ABOVE THE PROPOSED DAMS.....	5
SCENIC BEAUTY OF THE RIVER TO BE PRESERVED.....	5
EFFECT OF PROPOSED WORKS ON TRANSPORTATION COMPANIES AND THE GENERAL PUBLIC	6
CONTOUR SURVEYS ALONG THE RIVER.....	6
IMPROVEMENT IN ICE CONDITIONS AT CORNWALL.....	7
IMPROVEMENT IN ICE CONDITIONS ABOVE THE DAMS.....	8
 SUMMARY:—	
I ADVANTAGES TO THE GENERAL PUBLIC.....	8
II IMPROVEMENT OF NAVIGATION.....	8
III IMPROVEMENT IN ICE CONDITIONS.....	9
IV CORNWALL CANAL CONDITIONS.....	9
FORMAL REQUEST FOR PERMISSION TO CONSTRUCT THE PROPOSED WORKS.....	9

AMENDED PETITION

OF THE

ST. LAWRENCE POWER COMPANY,
LIMITED.

TO

His Excellency, The Governor-General
of Canada, in Council

FOR PERMISSION

To Erect the Structures Herein Described Near the
Town of Mille Roches, Ontario.

HUMBLY SHEWETH:—

December 12th, 1907, there was submitted to His Excellency, The Governor General of Canada, in Council, a Petition requesting permission to erect a dam, power house and works appurtenant thereto in the St. Lawrence river, near lock 20 in the Cornwall canal. Your Petitioners having improved their plans desire to submit a Petition amended accordingly.

PRELIMINARY.

The St. Lawrence Power Co., Limited, owns the power development at the foot of Sheek Island near Mille Roches, Ontario. It takes water from the Cornwall canal on the north side of Sheek Island and furnishes electric power and lights for the Cornwall canal and for Cornwall, Moulinette, Mille Roches and Wales.

The fall in the St. Lawrence river adjacent to the plant of the St. Lawrence Power Co., Limited, would, theoretically, furnish a substantial amount of power. The present owners of this Company secured possession believ-

ing that this theoretical power could be developed, at a reasonable cost, so as to materially increase the capacity of the existing plant. Investigation has shown that without the co-operation of the riparian owners on the opposite American shore, the St. Lawrence Power Co., Limited, can develop this power only to a very slight extent.

The capacity of the existing plant is limited to about 3000 continuous horse power and 2300 intermittent horse power available only a portion of the year. This continuous power could perhaps be increased to 6000 horse power, but this is the maximum amount that can be commercially developed entirely in Canada and without the co-operation of American interests. There is no other suitable site, adjacent to the Long Sault, that the St. Lawrence Power Co., Limited, could use for independently developing additional power.

The Long Sault Development Co., a New York State corporation, is empowered by its charter to construct dams, power houses, locks and works appurtenant thereto in the St. Lawrence river, so far as these works will be in American territory, and is therefore in a position to utilize the fall in the St. Lawrence river above mentioned.

The St. Lawrence Power Co., Limited, by co-operation with the Long Sault Development Co., in developing the power of the Long Sault, will be able to supply in Canadian territory a large amount of power, and only by such co-operation between these two companies can the full potentiality of the river be made available. Such development is in conformity with the fundamental principles of the conservation of natural resources.

A general outline of the plan is as follows:—

MAP SHOWING GENERAL LOCATION OF PROPOSED WORKS.

The map bound in the back of this Petition shows Long Sault, Sheek and Barnhart Islands, the Cornwall canal, and the location of the International Boundary with respect to the main channel on the St. Lawrence river. This main channel is in International waters on the north side of Long Sault Island; but, a short distance below the rapids which are principally between Long Sault and Sheek Islands, it lies south of Barnhart Island and entirely within American territory. About 95 per cent of the volume of water in the St. Lawrence river flows in this main channel south of Barnhart Island; the other 5 per cent flows through Little River and through the Cornwall canal. Little River forms the International channel between Barnhart and Sheek Islands. The location of the proposed dams, power houses, canals and new lock is also shown.

DAMS.

A dam, for convenience called the "Upper Dam", is proposed between the western end of Barnhart Island and the eastern end of Long Sault Island ; at each end of this dam next to the shores, there will be located a number of large sluice gates, the combined discharge of which will be about 100,000 second feet, or 40 per cent of the average flow of water in the river.

Another dam, called the "Lower Dam", is proposed between the easterly end of Barnhart Island and the Canadian shore; it will lie on both sides of the International Boundary.

It is proposed to construct both dams of solid concrete masonry and of the gravity type.

CANADIAN POWER HOUSE.

At the north-easterly end of the Lower Dam it is proposed to construct a large power house, between the dam and the Canadian shore near lock 20. This power house will be entirely in Canadian territory, and will be large enough to utilize all of the water that will be made available at this point by the construction of the dams.

SOUTH SAULT POWER HOUSE AND LOCK.

The Long Sault Development Co. proposes to construct a power house and lock across the South Sault Channel, between the foot of Long Sault Island and the main shore. The use of this lock will save approximately $4\frac{1}{2}$ hours time on each round trip of the boats which now use the Cornwall canal.

POWER HOUSE ON BARNHART ISLAND.

At the eastern end of Barnhart Island it is proposed to construct one, or possibly two, power houses, and to excavate a head race leading from the forebay immediately above the Lower Dam to these power houses.

CONTROLLING WORKS.

In addition to the sluice gates at the Upper Dam there will be constructed at each of the power houses a number of large sluice gates to control the water level above the dams. These gates will be from 35 to 50 feet wide with about 15 feet depth of water on the sills ; they will be so constructed that they can be operated throughout the entire year.

STABILITY OF STRUCTURES.

The financial success of this entire development, costing many millions of dollars, will be contingent upon the stability of all dams, power houses and controlling works. Any failure of these structures would cause great financial loss to the owners ; consequently as a matter of self-protection and insurance, unusually high factors of safety will be adopted throughout, so that they will be safe beyond question. The nature of the river channel is such that no loss of life or damage to property would follow failure of the dams.

Examinations and borings with diamond-and churn-drills, have shown that all important masonry structures will rest on a solid bed of limestone.

The bed of limestone will afford unquestionable foundations and ample expenditure of money will secure unusual stability and absolute safety of the proposed structures; the entire scheme, as an engineering proposition, has been submitted to and approved by Engineers who were selected not only by reason of their eminence but also by reason of their special and long experience with such problems.

MISCELLANEOUS CONSTRUCTION.

The width of Little River channel will be increased to about 1000 feet to provide a straight, wide and deep channel for conveying water to the power houses near the Lower Dam.

Earthen dikes will be constructed on the south side of the Cornwall canal, between locks 20 and 21, as may be required by Your Excellency in Council.

All changes to locks 20 and 21 made necessary by the construction of the proposed dams will be made free of cost to the Government.

GOVERNMENT APPROVAL AND INSPECTION.

It is proposed to have the Engineering Departments of both the Canadian and United States Governments approve the plans and, if desired, inspect the construction of the works that are to be built in their respective countries.

FUTURE WATER LEVELS.

It is proposed to raise the level of the river above the dams to such elevation as may be arranged and agreed upon and approved by Your Excellency in Council.

CORNWALL CANAL CONDITIONS.

The Cornwall canal is $11\frac{1}{2}$ miles in length, of which over 5 miles are formed by earth embankments ; between locks 20 and 21 there are over

2½ miles of these embankments which in places are subjected to over 35 feet head of water. When the proposed dams are built and the water in the river above them is raised to the proposed level, the present unbalanced pressure on the canal banks, between locks 20 and 21, will be practically eliminated, and all danger of a washout in this section of the canal will be removed. Below lock 20 the conditions will remain unchanged. The construction of the proposed works will reduce the present risk of a washout in the entire canal at least 50 per cent ; this result could only be obtained by the expenditure of many hundred thousand dollars by the Government.

The break in the canal bank, near lock 18, which occurred June 23, 1908, blocked all navigation in the Cornwall canal for 17 days. Had the South Sault lock been in operation at that time no delay whatever would have been caused by this washout, since all boats could have used the South Sault lock pending the repairs to the canal bank.

CONDITIONS ABOVE THE PROPOSED DAMS.

Careful surveys show that there is a surface fall varying from 12 to 14 feet in the St. Lawrence river between Morrisburg and lock 21.

When the water above the dams is raised to the proposed level, the great surface fall in the river between Morrisburg and lock 21 will prevent the main backwater rise from extending far above this lock. The river banks above the dam are so steep that the slight backwater rise will flood only a narrow strip averaging about 20 feet wide, and in many places less than five feet wide.

SCENIC BEAUTY OF THE RIVER TO BE PRESERVED.

The scenic beauty of the river above lock 21 will not be affected. Below the dams, the river scenery will remain practically unaltered. The only scenic change will be the replacement of the present rapids by long overflow dams ; the water will pass over the crests of these dams in two unbroken sheets with a combined length of one and one-half miles, and a height of approximately forty feet, nearly one-fourth that of Niagara Falls, a sight equal in grandeur to that of the Long Sault and one which is unique in all the world.

Under the present conditions the Long Sault is seen by tourists during the short Summer season of about four months, and then only for a very few minutes as they pass rapidly in a boat. Under the proposed conditions the scenery adjacent to the dams may be enjoyed by tourists throughout the year.

EFFECT OF PROPOSED WORKS ON TRANSPORTATION COMPANIES AND THE GENERAL PUBLIC.

The Long Sault is navigated by a single line of passenger boats; these boats make a daily trip down-stream during the summer tourist season June to September, inclusive. No rafts or freight steamers use the main channel on the north side of the eastern end of Long Sault Island, and no boats whatever can go up this channel. At a public hearing in Montreal Nov. 6th, 1907, objection was raised to the construction of the proposed dams on the ground that the obliteration of these rapids would greatly decrease the number of tourist passengers.

The construction of the proposed dams will afford the opportunity for tourists to pass through the highest lift masonry lock in the world and to see the two longest spillway dams that have ever been built, with water several feet deep passing over the crest and falling about forty feet; such attractions will more than offset a trip through the Long Sault, which is generally conceded to be less picturesque and thrilling than the Coteau Rapids, the Cedars, the Split Rock, the Cascades and Lachine Rapids, which are successively passed between this point and Montreal.

Passenger steamers will meet a delay of only about 30 minutes by using the South Sault lock as compared to shooting the Long Sault. On the west bound trip they will save at least two hours time as compared to passage through the Cornwall canal, so that on a round trip they will save about $1\frac{1}{2}$ hours time under the proposed conditions.

Freight steamers will be able to save at least $4\frac{1}{2}$ hours time on each round trip by using the South Sault lock.

The power from the proposed works will be used principally by factories and industries yet to be established within the radius of transmission of electricity from the power houses. Raw materials will be delivered to the factories from distant sources of supply and the finished products will be sent to the world's markets; the construction of the proposed works will greatly increase the revenue of the boat- and rail-transportation companies.

New industries and factories, contingent upon the development of the Long Sault, will give employment to thousands of persons and in one way or another all communities, using power from the proposed works, as well as the general public, will be substantially benefited thereby.

The construction of the proposed works will require the expenditure in Canada of over \$5,000,000, which will be distributed among Canadian transportation companies, manufacturers, tradesmen and workmen.

CONTOUR SURVEYS ALONG THE RIVER.

The Engineers of the St. Lawrence Power Co., Limited, have comple-

ted accurate surveys of the entire river from the eastern end of Barnhart Island to Waddington, a distance of about 23 miles. These surveys show all the contours, at $2\frac{1}{2}$ foot intervals, also the property lines on the Islands and the main shores, to a point above Croil Island; between this latter point and Waddington the contours and property lines were surveyed to Elevation 215, sea level datum. These maps, so far as they have been worked up, are submitted herewith on Plans Numbers 2, 3, and 4; from them can be determined all questions that will be involved when the river is raised to the proposed level. These surveys cover over ninety square miles of territory and required the services of about 65 men for a period of nearly eight months.

The St. Lawrence Power Co., Limited, has acquired much land and many riparian rights that will be affected by the proposed changes, and negotiations are under way for securing the remainder.

The Long Sault Development Co., on the American side, has acquired practically all of Barnhart Island and the eastern half of Long Sault Island together with riparian rights around the western end of the island, also nearly 2000 acres of land on the main shore, extending from a point opposite the eastern end of Barnhart Island, upstream to the Massena canal, a distance of about 8 miles. Both Companies are acquiring land on their respective sides of the river to Elevation 215, sea level datum, which will be well above the future river level; they are also securing riparian rights along the streams that flow into the St. Lawrence river, where there is any possibility of riparian damage being caused.

Mention of the above is made to illustrate to what extent the two Companies have gone thus far in the line of preparing plans, acquiring property, riparian rights, etc., in connection with the proposed development, and to show that they are proposing a bona fide power development, and are not seeking to secure a franchise to sell to others at a profit.

IMPROVEMENT IN ICE CONDITIONS AT CORNWALL.

The greater part of the frazil-ice in the section of the river above Cornwall is formed in the swift open stretches of water above the Long Sault and in the rapids themselves. The construction of the proposed dams will reduce the velocity of the river above them; the Long Sault will be entirely obliterated and there will be a great reduction in the amount of frazil-ice that will be formed.

Under existing conditions the enormous masses of frazil-ice that are formed in and above the rapids, pass down stream to the quiet water at the head of Lake St. Francis; here they form hanging dams on the under side of the sheet-ice on the lake. Every winter these hanging dams create a flood of backwater that rises from 15 to 30 feet above the normal summer level of the water in the river endangering the town of Cornwall. In the

year 1887 the backwater extended as far as Fifth Street, so that practically two-thirds of the town was flooded.

The danger of winter flood and backwater at Cornwall will not be entirely removed by the proposed dams, but the danger arising from the annual ice jam will be very much lessened, a point of vital importance to the people of Cornwall.

IMPROVEMENT IN ICE CONDITIONS ABOVE THE DAMS

In previous years, notably 1887 and 1905, large ice jams formed at critical points in the river channel opposite Farrans Point and also on the south side of Croil Island. The backwater caused by these jams extended up-stream as far as Morrisburg. After the proposed dams are constructed a fleet of ice breaking boats will be operated to keep these critical points free from congestion, and thus prevent a repetition of these floods.

S U M M A R Y .

I. ADVANTAGES TO THE GENERAL PUBLIC.

- (A) The construction of these works in Canada will afford abundant, reliable and cheap power to all districts within the radius of transmission of electricity from the power houses.
- (B) The furnishing of cheap power will create many new industries and will be of great advantage to those already established.
- (C) The construction of the proposed dams and power house will require the expenditure in Canada of over \$5,000,000, which will be distributed among the Canadian transportation companies, manufacturers, tradesmen and workmen. It is impossible to estimate the amount which will be expended in Canada directly or indirectly consequent upon the utilization of this power, but the amount required for the construction of the works, installation of transmission lines, etc., etc., will run into many millions of dollars.
- (D) The power from the entire development will be used almost exclusively for manufacturing purposes and the products must be distributed by boat or rail; this will mean increased revenue to the transportation companies for all future time.

II. IMPROVEMENT OF NAVIGATION.

- (A) Navigation will be very much improved. The present practically impassable rapids will be eliminated and in their place will be a broad and safe stream. The velocity of the current in the Farrans Point and the Big Sny channels will be substantially lessened.

- (B) The South Sault lock will duplicate the means now afforded by the Cornwall canal for navigation past the Long Sault and will postpone the time when the Cornwall canal must be enlarged at great expense to the Canadian Government.
- (C) The duplication of navigation facilities past the Long Sault will insure shipping interests against delay due to failure or accident in either the Cornwall canal or the South Sault lock.
- (D) The construction of these works will enable boats passing the Long Sault to make a round trip in approximately $4\frac{1}{2}$ hours less time than at present.
- (E) The South Sault lock will be operated seven days per week during the navigation season, and like the Cornwall canal will be toll free.

III. IMPROVEMENT IN ICE CONDITIONS.

- (A) Ice conditions below the dams will be much improved, thus reducing the danger from the annual ice gorges and floods at Cornwall.
- (B) The river above the dams will be kept free from ice jams so that a repetition of the floods of 1887 and 1905 will not occur again.

IV. CORNWALL CANAL CONDITIONS.

- (A) The proposed development will be made, preserving the integrity and utility of the Cornwall canal.
- (B) The proposed development is so planned that traffic in the Cornwall canal will not be affected by the development in any way whatsoever. The Cornwall canal will remain unchanged and will be open to traffic both during the construction period and forever thereafter.
- (C) When the water above the dams is raised to the proposed level, all danger of a washout of canal banks between locks 20 and 21 will be entirely and permanently removed.

FORMAL REQUEST FOR PERMISSION TO CONSTRUCT THE PROPOSED WORKS.

The St. Lawrence Power Co., Limited, asks permission as follows :—

(A) To construct a dam extending from a point near the Canadian shore, opposite lock 20 in the Cornwall canal, to the International Boundary, there to join a dam to be constructed, in American territory, in connection with the proposed works.

(B) To construct a power house, between the north easterly end of said dam and the Canadian shore.

(C) To strengthen the dikes on the south side of the Cornwall canal between locks 20 and 21, and to make such changes to these locks as may be required, free of cost to the Government.

(D) To enlarge Little River channel on the Canadian side of the International Boundary, and to raise and maintain the river level above the dams at the elevation agreed upon and approved by Your Excellency in Council.

(E) To construct, maintain, operate and amplify the said dams, power houses, dikes, channels, water levels and other works necessary and appurtenant to the proposed complete development, subject to the approval of Your Excellency in Council.

And your Petitioners as in duty bound will ever pray.

Respectfully submitted,

ST. LAWRENCE POWER COMPANY, LIMITED,

President.

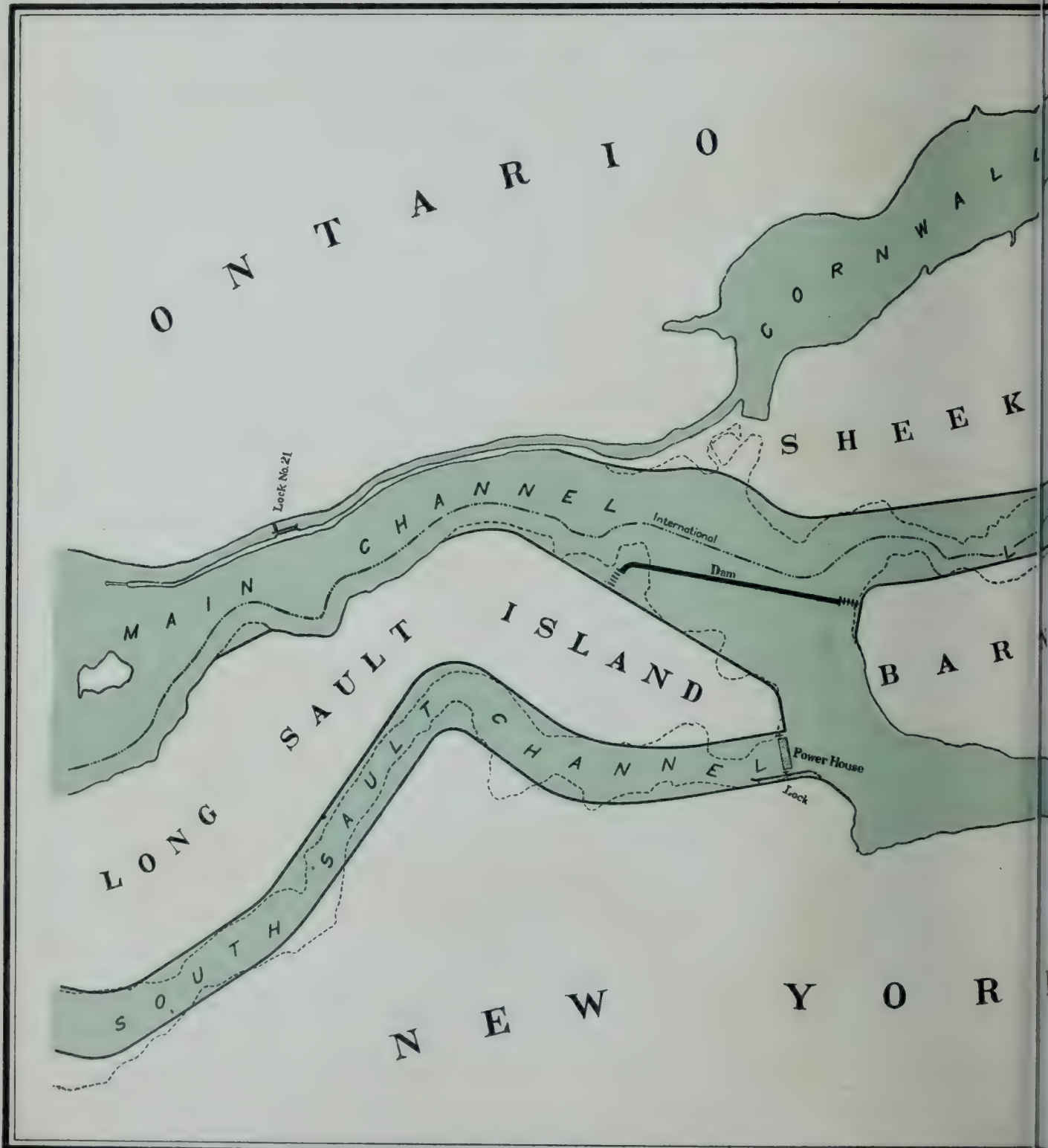
MONTREAL,.....1909.

MAP SHOWING

DAMS, CANALS AND

PROPOSED

ST. LAWRENCE POWER CO. LIMITED, A



LOCATION OF
D POWER HOUSES
SED BY
AND LONG SAULT DEVELOPMENT CO.



Plan I.

